



# SPEC® CFP2006 Result

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## Hewlett-Packard Company

### SPECfp®\_rate2006 = 214

ProLiant DL585 G5  
(2.8 GHz AMD Opteron 8386 SE)

### SPECfp\_rate\_base2006 = 193

CPU2006 license: 3

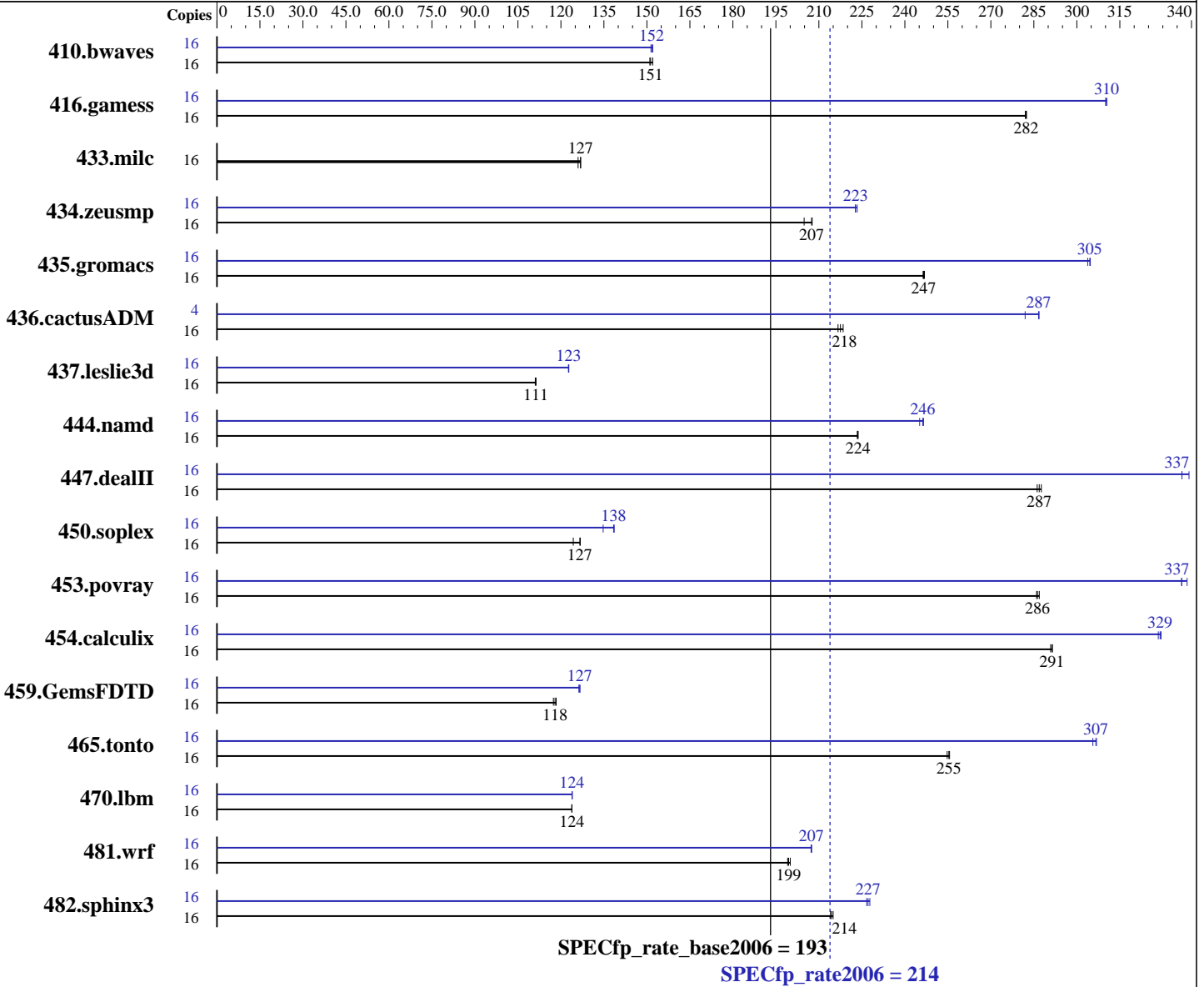
Test date: Jan-2009

Test sponsor: Hewlett-Packard Company

Hardware Availability: Jan-2009

Tested by: Hewlett-Packard Company

Software Availability: Dec-2008



### Hardware

CPU Name: AMD Opteron 8386 SE  
 CPU Characteristics:  
 CPU MHz: 2800  
 FPU: Integrated  
 CPU(s) enabled: 16 cores, 4 chips, 4 cores/chip  
 CPU(s) orderable: 2,4 chips  
 Primary Cache: 64 KB I + 64 KB D on chip per core  
 Secondary Cache: 512 KB I+D on chip per core

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### Software

Operating System: Red Hat Enterprise Linux Server release 5.2, Kernel 2.6.18-92.el5  
 Compiler: PGI Server Complete Version 8.0 PathScale Compiler Suite Version 3.2  
 Auto Parallel: Yes  
 File System: ext3  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit

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L3 Cache: 6 MB I+D on chip per chip  
Other Cache: None  
Memory: 64 GB (16x4 GB, PC2-6400P CL5)  
Disk Subsystem: 1x146 GB 15 K SAS  
Other Hardware: None

Other Software: binutils 2.18  
32-bit and 64-bit libhugetlbfs libraries

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	16	<b>1437</b>	<b>151</b>	1430	152	1440	151	16	1430	152	<b>1433</b>	<b>152</b>	1436	151
416.gamess	16	1109	282	<b>1110</b>	<b>282</b>	1111	282	16	<b>1009</b>	<b>310</b>	1010	310	1009	310
433.milc	16	1166	126	1158	127	<b>1158</b>	<b>127</b>	16	1166	126	1158	127	<b>1158</b>	<b>127</b>
434.zeusmp	16	711	205	<b>702</b>	<b>207</b>	701	208	16	652	223	654	223	<b>654</b>	<b>223</b>
435.gromacs	16	<b>463</b>	<b>247</b>	463	247	464	246	16	376	304	375	305	<b>375</b>	<b>305</b>
436.cactusADM	16	882	217	875	218	<b>879</b>	<b>218</b>	4	<b>167</b>	<b>287</b>	167	287	170	282
437.leslie3d	16	1354	111	1352	111	<b>1352</b>	<b>111</b>	16	1227	123	<b>1226</b>	<b>123</b>	1225	123
444.namd	16	574	224	574	223	<b>574</b>	<b>224</b>	16	523	245	<b>521</b>	<b>246</b>	521	247
447.dealII	16	<b>638</b>	<b>287</b>	636	288	640	286	16	540	339	544	337	<b>544</b>	<b>337</b>
450.soplex	16	1073	124	<b>1054</b>	<b>127</b>	1053	127	16	990	135	<b>964</b>	<b>138</b>	963	139
453.povray	16	298	286	<b>297</b>	<b>286</b>	297	287	16	253	337	<b>253</b>	<b>337</b>	251	338
454.calculix	16	453	291	<b>453</b>	<b>291</b>	454	291	16	402	328	401	329	<b>401</b>	<b>329</b>
459.GemsFDTD	16	1434	118	1446	117	<b>1439</b>	<b>118</b>	16	1340	127	<b>1341</b>	<b>127</b>	1344	126
465.tonto	16	616	256	618	255	<b>617</b>	<b>255</b>	16	513	307	<b>513</b>	<b>307</b>	515	306
470.lbm	16	1775	124	1775	124	<b>1775</b>	<b>124</b>	16	1775	124	<b>1774</b>	<b>124</b>	1773	124
481.wrf	16	894	200	898	199	<b>896</b>	<b>199</b>	16	862	207	861	207	<b>862</b>	<b>207</b>
482.sphinx3	16	1451	215	<b>1455</b>	<b>214</b>	1457	214	16	1376	227	1369	228	<b>1373</b>	<b>227</b>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Submit Notes

The config file option 'submit' was used.  
numactl was used to bind copies to the cores

## Operating System Notes

Environment stack size set to 'unlimited'  
Max locked memory set to 2097152  
The libhugetlbfs libraries were installed using the installation rpms that came with the distribution.  
PGI\_HUGE\_PAGES set to 896.  
Total number of huge pages available is 14336.  
NCPUS set to number of cores



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## Platform Notes

BIOS configuration:  
Power Regulator set to Static High Performance Mode

## General Notes

Environment variables set by runspec before the start of the run:  
HUGETLB\_MORECORE = "yes"  
NCPUS = "4"

## Base Compiler Invocation

C benchmarks:  
pgcc  
  
C++ benchmarks:  
pgcpp  
  
Fortran benchmarks:  
pgf95  
  
Benchmarks using both Fortran and C:  
pgcc pgf95

## Base Portability Flags

410.bwaves: -DSPEC\_CPU\_LP64  
416.gamess: -DSPEC\_CPU\_LP64  
433.milc: -DSPEC\_CPU\_LP64  
434.zeusmp: -DSPEC\_CPU\_LP64  
435.gromacs: -DSPEC\_CPU\_LP64 -Mnomain  
436.cactusADM: -DSPEC\_CPU\_LP64 -Mnomain  
437.leslie3d: -DSPEC\_CPU\_LP64  
444.namd: -DSPEC\_CPU\_LP64  
447.dealII: -DSPEC\_CPU\_LP64  
450.soplex: -DSPEC\_CPU\_LP64  
453.povray: -DSPEC\_CPU\_LP64  
454.calculix: -DSPEC\_CPU\_LP64 -Mnomain  
459.GemsFDTD: -DSPEC\_CPU\_LP64  
465.tonto: -DSPEC\_CPU\_LP64  
470.lbm: -DSPEC\_CPU\_LP64  
481.wrf: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_CASE\_FLAG -DSPEC\_CPU\_LINUX  
482.sphinx3: -DSPEC\_CPU\_LP64



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## Base Optimization Flags

C benchmarks:

-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed  
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

C++ benchmarks:

-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed  
--zc\_eh -Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

Fortran benchmarks:

-Mvect=cachesize:6291456 -fastsse -Mfprelaxed -Msmartalloc=huge  
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

Benchmarks using both Fortran and C:

-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed  
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

## Base Other Flags

C benchmarks:

-Mipa=jobs:4

C++ benchmarks:

-Mipa=jobs:4

Fortran benchmarks:

-Mipa=jobs:4

Benchmarks using both Fortran and C:

-Mipa=jobs:4

## Peak Compiler Invocation

C benchmarks:

pgcc

C++ benchmarks (except as noted below):

pathCC

444.namd: pgcpp

Fortran benchmarks (except as noted below):

pathf95

410.bwaves: pgf95

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## Peak Compiler Invocation (Continued)

434.zeusmp: pgf95

437.leslie3d: pgf95

Benchmarks using both Fortran and C (except as noted below):

pgcc pgf95

435.gromacs: pathcc pathf95

481.wrf: pathcc pathf95

## Peak Portability Flags

410.bwaves: -DSPEC\_CPU\_LP64

416.gamess: -DSPEC\_CPU\_LP64

433.milc: -DSPEC\_CPU\_LP64

434.zeusmp: -DSPEC\_CPU\_LP64

435.gromacs: -DSPEC\_CPU\_LP64

436.cactusADM: -DSPEC\_CPU\_LP64 -Mnomain

437.leslie3d: -DSPEC\_CPU\_LP64

444.namd: -DSPEC\_CPU\_LP64

453.povray: -DSPEC\_CPU\_LP64

454.calculix: -DSPEC\_CPU\_LP64 -Mnomain

459.GemsFDTD: -DSPEC\_CPU\_LP64

465.tonto: -DSPEC\_CPU\_LP64

470.lbm: -DSPEC\_CPU\_LP64

481.wrf: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_LINUX -fno-second-underscore

482.sphinx3: -DSPEC\_CPU\_LP64

## Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: -Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge

-Mprefetch=t0 -Mloop32 -Mfprelaxed -Mipa=fast -Mipa=inline  
-tp barcelona-64 -Bstatic\_pgi

482.sphinx3: -Mphi=indirect(pass 1) -Mpfo=indirect(pass 2)

-Mipa=fast(pass 2) -Mipa=inline(pass 2)

-Mvect=cachesize:6291456 -fastsse -Mfprelaxed -Msmartalloc  
-tp barcelona-64 -Bstatic\_pgi

C++ benchmarks:

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## Peak Optimization Flags (Continued)

444.namd: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)  
-Mipa=inline(pass 2) -Mvect=cachesize:6291456 -fastsse  
-Munroll=n:4 -Munroll=m:8 -Msmartalloc=huge -Mnodepch  
-Mfprelaxed --zc\_eh -tp barcelona-64 -Bstatic\_pgi

447.deallI: -march=barcelona -Ofast -INLINE:aggressive=on -LNO:opt=0  
-OPT:alias=disjoint -fno-exceptions -m32

450.soplex: -march=barcelona -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -L/usr/lib -lhugetlbfs(pass 2) -O3  
-INLINE:aggressive=on -OPT:IEEE\_arith=3  
-OPT:IEEE\_NaN\_Inf=off -OPT:fold\_unsigned\_relops=on  
-OPT:malloc\_alg=1 -CG:load\_exe=0 -fno-exceptions -m32

453.povray: -march=barcelona -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -Ofast -INLINE:aggressive=on

### Fortran benchmarks:

410.bwaves: -Mvect=cachesize:6291456 -fastsse -Msmartalloc  
-Mprefetch=nta -Mfprelaxed -Mipa=fast -Mipa=inline  
-tp barcelona-64 -Bstatic\_pgi

416.gamess: -march=barcelona -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2)  
-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf\_x86\_64.xBDT(pass 2)  
-L/usr/lib64 -lhugetlbfs(pass 2) -O2 -OPT:Ofast -OPT:ro=3  
-OPT:unroll\_size=256

434.zeusmp: -Mvect=cachesize:6291456 -fastsse -Mfprelaxed  
-Mprefetch=distance:8 -Mprefetch=t0 -Msmartalloc=huge  
-Msmartalloc=hugebss -Mipa=fast -Mipa=inline  
-tp barcelona-64 -Bstatic\_pgi

437.leslie3d: -Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2)  
-Mipa=fast(pass 2) -Mipa=inline(pass 2)  
-Mvect=cachesize:6291456 -fastsse -Mvect=fuse  
-Msmartalloc=huge -Mprefetch=distance:8 -Mprefetch=t0  
-Mfprelaxed -tp barcelona-64 -Bstatic\_pgi

459.GemsFDTD: -march=barcelona -Ofast -LNO:fission=2 -LNO:simd=2  
-LNO:prefetch\_ahed=1 -CG:load\_exe=0 -CG:prefer\_lru\_reg=off  
-OPT:malloc\_alg=1  
-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf\_x86\_64.xBDT  
-L/usr/lib64 -lhugetlbfs

465.tonto: -march=barcelona -Ofast -OPT:alias=no\_f90\_pointer\_alias  
-LNO:blocking=off -CG:load\_exe=1 -IPA:plimit=525  
-OPT:malloc\_alg=1  
-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf\_x86\_64.xBDT  
-L/usr/lib64 -lhugetlbfs

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## Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

435.gromacs: -march=barcelona -Ofast -OPT:rsqrt=2 -OPT:malloc\_alg=1  
-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf\_x86\_64.xBDT  
-L/usr/lib64 -lhugetlbfs

436.cactusADM: -Mvect=cachesize:6291456 -fastsse -Mconcur  
-Msmartalloc=huge -Mfprelaxed -Mipa=fast -Mipa=inline  
-tp barcelona-64 -Bstatic\_pgi

454.calculix: -Mphi=indirect(pass 1) -Mpfo=indirect(pass 2)  
-Mipa=fast(pass 2) -Mipa=inline(pass 2)  
-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge  
-Mprefetch=t0 -Mpre -Mfprelaxed -tp barcelona-64  
-Bstatic\_pgi

481.wrf: -march=barcelona -Ofast -LNO:blocking=off  
-LNO:prefetch\_ahead=10 -LANG:copyinout=off  
-IPA:callee\_limit=5000 -GRA:prioritize\_by\_density=on  
-OPT:malloc\_alg=1 -m3dnow  
-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf\_x86\_64.xBDT  
-L/usr/lib64 -lhugetlbfs

## Peak Other Flags

C benchmarks:

-Mipa=jobs:4(pass 2)

C++ benchmarks:

444.namd: -Mipa=jobs:4(pass 2)

Fortran benchmarks (except as noted below):

-Mipa=jobs:4(pass 2)

416.gamess: No flags used

459.GemsFDTD: No flags used

465.tonto: No flags used

Benchmarks using both Fortran and C (except as noted below):

-Mipa=jobs:4(pass 2)

435.gromacs: No flags used

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## Peak Other Flags (Continued)

481.wrf: No flags used

The flags files that were used to format this result can be browsed at

[http://www.spec.org/cpu2006/flags/pgi80\\_linux\\_flags.20090710.00.html](http://www.spec.org/cpu2006/flags/pgi80_linux_flags.20090710.00.html)

[http://www.spec.org/cpu2006/flags/CPU2006\\_flags.20090710.html](http://www.spec.org/cpu2006/flags/CPU2006_flags.20090710.html)

<http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.20090710.html>

You can also download the XML flags sources by saving the following links:

[http://www.spec.org/cpu2006/flags/pgi80\\_linux\\_flags.20090710.00.xml](http://www.spec.org/cpu2006/flags/pgi80_linux_flags.20090710.00.xml)

[http://www.spec.org/cpu2006/flags/CPU2006\\_flags.20090710.xml](http://www.spec.org/cpu2006/flags/CPU2006_flags.20090710.xml)

<http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.20090710.xml>

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For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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